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EXAMINER

CALANDRA, ANTHONY J

ART UNIT

PAPER NUMBER

1741

NOTIFICATION DATE

DELIVERY MODE

06/28/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/583,712	BUCHERT ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	ANTHONY CALANDRA	1741	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 August 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

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***Detailed Office Action***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/23/2010 has been entered.

The request for suspension of action dated 8/23/2010 is expired. Claim 42 is new. Claims 1-42 are currently pending.

***Response to Arguments***

The applicant states that claims 1, 5, and 16 have been amended and that claims 42-46 are new. The examiner has reviewed the case file and these claims have not been amended or added as argued by the applicant. In 6/22/2010 a claim amendment after Final was submitted. This amendment was not entered by the examiner in the Advisory Action dated 7/12/2010. On 8/23/2010 a new set of claims was filed with a Request for Reexamination. These claims only added new claim 42 and do not add new claims 43-46 or amend claims 1, 5, and 16. No additional claim filings have occurred. Should the applicant decide to enter subsequent amendments the examiner notes the comments regarding potential 112 2<sup>nd</sup> errors as discussed in the 7/12/2010 advisory action.

***112 2<sup>nd</sup> rejections***

**The applicant maintains that in the present invention the laccase activity was determined using ABTS as a substrate at room temperature using a pH of 4.5. The applicant argues**

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**the specific conditions. The applicant asks for reconsideration of the rejection in view of evidentiary reference NIKU-PAA VULA.**

The applicant now argues that the laccase activity was determined using ABTS as a substrate, at room temperature and using a pH of 4.5. This conflicts with the applicant's previous arguments dated 12/08/2009 which stated that the specific condition is determined based upon the specific conditions of each chemical reaction [pg. 4 lines 1 and 2] and then even conflicts with the sentence in the current arguments "*The specific conditions of each chemical reaction are described in the working examples so that enzyme activity can be calculated in katal for each condition*". Either laccase activity is determined based upon a specific set of conditions or on varying conditions.

Further, the applicant's specification makes no mention of this newly defined method of determining laccase based upon ABTS at a pH of 4.5 and room temperature anywhere in the specification. Therefore the applicant fails to provide support for the first interpretation and if recited in a claim or in the specification would raise new issues under 112, first paragraph.

Furthermore such a claim would also raise new issues under 112, second paragraph since the applicant lists multiple conditions at which the reaction can take place [pg. 8 lines 4-12] and multiple reactants the claim language has no limit as to what 'nkat' can define as activity will change depending on different conditions as such 'nkat' is defined relatively. A claim term must be defined based on a standard that is recognizable to the person of ordinary skill in the art not a moving target.

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The art provided by the applicant shows that an enzyme activity is defined at a specific temperature, with a specific substrate, at a specific pH, and specific time/substrate consumption [pg. 1988 column 1 paragraph 1].

*Art rejections*

*Goodell*

***Argues that there is a requirement to pick and choose from the reference of Goodell of the two claimed species of quercetin and kaemferol.***

In response to the applicants argument regarding picking and choosing, a reference that clearly names the claimed species anticipates the claim no matter how many other species are named [see e.g. MPEP 2131.02]. In this case GOODELL clearly names both quercetin and kaemferol and therefore the claims stand anticipated.

***Applicant argues that the identified chelators to do not expressly or inherently act as modifying agents and even if they did they would not provide the desired functional groups***

Goodell teaches adding quercetin or kaemferol to lignocellulose along with peroxide. Quercetin and kaemferol are the same species claimed in dependent claim 15. Peroxide is an agent capable of causing modification as per instant claim 29. The fact that the applicant has discovered that quercetin or kaemferol in addition to acting as redox cycling chelators also modify the surface of the fiber is not sufficient to overcome anticipation [see e.g. MPEP 2112 (I)].

The applicant has not shown a difference between the method steps of Goodell and the instant claims by which the instant claims would have quercetin bonded but Goodell wouldn't.

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Nor has the applicant explained why the surface modification be the same. Finally the applicant fails to claim any specific surface modification.

*Jaschinski*

**The applicant argues that Jaschinski fails to disclose chemical oxidizing agents that are salts.**

As stated earlier these claim amendments have not been made by the applicant in the 8/23/2010 amendment.

*Pederson*

***The applicant argues that Pederson fails to provide a modifying agent that is capable of providing properties foreign to the fiber.***

Ferulic acid at least increases the negative charge of the fibers. A fiber with a high negative charge that did not exist on the fiber prior to charge has a new property added to the fiber. This is in addition to ferulic acid being an antioxidant, an antibacterial agent, and a yellowing preventing agent.

***The applicant states that Pederson does not disclose that the modified fiber is polymerized in the presence of the oxidizing agent in a way that one end of the polymer is attached to the primed fibers.***

Pederson does teach attaching ferulic acid amongst other species to lignocellulosic fibers in the presence of oxidizing agents. The instant claims do not require that polymerization or

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even mention polymers. The instant claims only claim that the fiber is contacted by the modifying agent and that the modifying agent is compatible with the fiber.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 22 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 22 and 40 are rejected based on the indefinite definition of nkat/g. The applicant still gives an undefined explanation for how this is calculated. The applicant states that “The determination of the enzyme activities has been carried out in the examples in the same conditions (pH, temperature) using standard activity measurements in the conditions in which the enzyme treatments of the materials have been effected”.

This is in contrast to an art such as PEDERSON which specifically describes how to calculate the laccase enzyme activity in the publication:

“

(37) *Laccase activity as defined herein is determined on the basis of spectrophotometric measurements of the oxidation of syringaldazin under aerobic conditions. The intensity of the violet colour produced in the oxidation reaction is measured at 530 nm.*

(38) *The analytical conditions are: 19 .mu.M syringaldazin, 23.2 mM acetate buffer, pH 5.5, 30.degree. C., reaction time 1 minute, shaking. 1 laccase unit (LACU) is the amount of enzyme*

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*that catalyses the conversion of 1 .mu.M of syringaldazin per minute under these conditions".*

In contrast the instant specification gives no applicable temperature or pH. The applicant's explanation in the arguments does not clear up the deficiencies as the arguments state that the activity value is based off of each experimental pH/temperature combination. In general activity values are measured in comparison to a standard set of assay conditions not a set of conditions which changes based on variable temperatures/pH's [see e.g. Units of Enzyme Activity pg. 319 #1]. Since the Applicant gives variable temperatures/pHs that can be used, the definition of nkat/g is also necessarily variable and indefinite.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 9-15, 23-29, 31-34 and 41-42 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. 2003/0186036 GOODELL et al., hereinafter GOODELL as evidenced by *Photostability of Quercetin under Exposure to UV irradiation* by VICENTINI et al., hereinafter VINCENTINI and by *Antibacterial effect of phenolic compounds from different wines* by VAQUERO, hereinafter VAQUERO.



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As for claim 1, 2, 5, 6, 15, 28, 29, 32-34, and 41, GOODELL discloses activating/oxidizing lignocellulosic materials and other phenoxy containing compounds [abstract, 0026 and 0029]. GOODELL discloses that the fiber is oxidized with peroxide and Fenton reagents [0023 and 0081]. GOODELL discloses the use of quercetin and kaemferol (kaempherol) [0099] during the reaction in addition to other compounds. As GOODELL uses the same chemical additives as the instant claims (quercetin and kaemferol) said chemicals act as modifying agents. GOODELL further discloses increased whiteness with increased treatment time [Figure 7, decrease in light absorption of dyes when reacted with the peroxide, Fenton, mediator].

As for claim 3, GOODELL discloses that the agents act in a redox reaction therefore the Fenton reaction activates the modifying agent [0099-0101].

As for claim 4, GOODELL uses the same chemical additives as the instant claims (quercetin and kaemferol) acting as modifying agents which whiten the fibers. GOODELL further discloses increased whiteness with increased treatment time [Figure 7, decrease in light absorption of dyes when reacted with the peroxide, Fenton, mediator]. Further the modifying agents also act as signaling agents as the effect of light absorption can be detected.

As for claims 9-14, GOODELL discloses multiple compounds which are capable of being modified to add additional properties to said compounds [0099]. Examiner bases this on the fact that other compounds can be bonded to the compounds of GOODELL and thus provide the properties as disclosed. Quercetin, one of the compounds disclosed by GOODELL, can act as an antibacterial agent as evidenced by VAQUERO [pg. 96 Table II], act as a sensor by

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changing the color of the fiber (whitening) and also attenuates UV by having a high antioxidant potential as evidenced by VICENTINI [pg. 119 column 2].

As for claims 23 and 24, GOODELL discloses both peroxide and oxygen containing compounds [0023].

As for claim 25, GOODELL discloses the consistency of 6% which falls within the instant claimed range [0164; 500 grams / 8500 grams].

As for claim 26, GOODELL discloses a liquid solution containing water [0164]. As the solution is liquid a person of ordinary skill in the art can surmise that the temperature is between 0 and a 100 degrees C which overlaps with the instant claimed temperature range with sufficient specificity.

As for claim 27, GOODELL discloses that the fiber is pressed to remove water forming a fiber mat, heated and cooled [0164]. Examiner has interpreted this as a fibrous web.

As for claim 31, GOODELL discloses that the chemicals were blended together which the examiner has interpreted as a simultaneous reaction.

As for claim 42, GOODELL suggests that one oxidant that may be used is permanganate [0023]. The term permanganate describes the anion present of a salt of permanganic acid.

3. Claims 1-6, 9-14, 23-31 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. 6,136,041 JASCHINSKI et al., hereinafter JASCHINSKI.

As for claims 1, 3, and 5, JASCHINSKI discloses contacting with an oxidizing compound [column 6 lines 1-11, abstract] while also contacting the pulp with a second compound including 1-10-phenanthroline a nitrogen containing compound which was found to greatly increase brightness [column 16 lines 1-28]. The second compound increases the

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brightness of the pulp and additionally adds nitrogen to the fiber. Therefore the compound acts as a modifying agent. JASCHINSKI discloses multiple compounds such as 1-10 phenanthroline which is a compound which contains more than one functional group, including two imine groups. The additive helps activate the reaction [abstract].

As for claims 2, 6, 23, 24, 28, 29, and 41, JASCHINSKI discloses both hydrogen peroxide [claim 3] and discloses ozone which is an oxygen containing gas [claim 2] both of which are capable of oxidizing phenolic compounds.

As for claims 4, and 9-14, JASCHINSKI discloses multiple compounds which are capable of being modified to add additional properties to said compounds [0099]. Examiner bases this on the fact that other compounds can be bonded to the compounds of JASCHINSKI and thus provide the properties as disclosed. JASCHINSKI discloses contacting the pulp with 1-10-phenanthroline a nitrogen containing compound which was found to greatly increase brightness [column 16 lines 1-28]. In addition to affecting the brightness of the pulp, the nitrogen containing compound adds nitrogen to the fiber. Additional nitrogen would be detectable under mass-spectroscopy. The 1-10-phenanthroline affects the pulps negative/positive charge, acts a sensor, and affects the color of the fiber.

As for claim 25, JASCHINSKI discloses the treatment consistency of 0.5 to 50% [claim 10] which overlaps with the instant claimed range with sufficient specificity.

As for claim 26, JASCHINSKI discloses the treatment temperature of 90 degrees C which falls within the instant claimed range [Table 10, 11, and 12].

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As for claim 27, JASCHINSKI discloses the treatment consistency of 0.5 to 50% [claim 10]. At 50% consistency a majority of the water has been removed and the pulp can be considered a fibrous web.

As for claim 30, it is not clear the steps or the amount of radiation emitted onto the fiber, or consistency of the fiber. As paper web/pulp are subjected to light on a paper machine, at least some light radiation (including UV) strikes the pulp/paper web capable of oxidizing a phenol group. Examiner notes peroxide with ultraviolet light forms hydroxyl radicals, an advanced oxidation process.

As for claim 31, JASCHINSKI discloses adding the reactants simultaneously to the fiber [column 10 lines 20-60].

4. Claims 1-14, 16-21, 23-33, 35-39 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,187,136 PEDERSEN et al., hereinafter PEDERSON as evidenced by U.S. 2007/0163735 BUCHERT et al., hereinafter BUCHERT and *Antibacterial activity directed isolation of compounds from Onosoma hipidum* by NAZ et al., hereinafter NAZ.

As for claim 1, 5, 32 and 33, PEDERSON discloses oxidizing lignocellulose phenol groups [column 8 lines 25-37] and then contacting the cellulose with a compound with a first functional group, ferulic acid [column 10 lines 25-30]. Ferulic acid provides the fiber with a property that is foreign to the native fiber and acts as a signaling agent. Ferulic acid increases surface charge [column 10 lines 55-60] and can be detected with conductometric titration, therefore it provides the fiber with properties foreign to the fiber. Ferulic acid contains more than two functional groups. Ferulic acid also prevents photo-yellowing and this acts as a

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whitening agent as evidenced by BUCHERT [pg. 4 Table 1]. NAZ also provides evidence that ferulic acid works as a an antibacterial [summary].

As for claims 2, 6, 17, 19, 20, 21, 23, 24, 28, 29, and 41 PEDERSON discloses laccases, peroxidases, and oxidases for oxidizing the phenolic group [column 6 lines 1-30]. PEDERSON also discloses peroxides and oxygen oxidants including atmospheric air [column 7 lines 60-67 and column 8 lines 1-10].

As for claim 3, PEDERSON discloses that the fiber matrix is reacted with an enzyme oxidizing agents including laccase [column 6 lines 1-10 and column 10 lines 25-32]. PEDERSON discloses that the enzyme oxidizes the phenolic structures and that the mediator is bonded to the fiber. Therefore the mediator/signaling agent is activated [column 4 lines 1-35].

As for claim 4, ferulic acid provides the fiber with a property that is foreign to the native fiber and acts as a signaling/sensing agent. Ferulic acid increases surface charge [column 10 lines 55-60]. Further by increasing surface charge it can act as a retention agent for cationic materials.

As for claims 7, 8, 35-39, ferulic acid contains an unsaturated carbon tail with 3 carbon groups.

As for claims 9-14, Ferulic acid provides the fiber with a property that is foreign to the native fiber and acts as a signaling agent/sensing agent. Ferulic acid increases surface charge [column 10 lines 55-60] and can be detected with conductometric titration, therefore is conductive. Ferulic acid acts to prevent photo-yellowing and thus is UV-resistant and changes the color of the fiber (whiter) as evidenced by BUCHERT [pg. 4 Table 1]. Ferulic acid can act as an antibacterial agent. Further, as Ferulic acid adds an anionic charge to the fiber any cationic

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additive can be added to the system to provide the properties of the instant claims. Therefore Ferulic acid is capable of being modified.

As for claim 16, PEDERSON discloses oxidizing lignocellulose phenol groups [column 8 lines 25-37] and then contacting the cellulose with a compound with a first functional group, Ferulic acid [column 10 lines 25-30]. Subsequent to this step the lignocellulosic fiber is contacted with an additional component a strengthening agent cationic starch or cationic polyacrylate [column 9 lines 1-16]. The polyacrylate increases the strength of the fiber matrix. The strength of the fiber matrix can be tested with physical strength testing therefore polyacrylate acts as a signaling agent. Further, polyacrylate can be detected by way of mass spectroscopy as the addition to fibers would alter the chemical composition.

As for claim 18, Ferulic acid has more than one functional site including double bonds and a phenol, hydroxyl groups, and carboxyl groups which are functional sites. PEDERSON also discloses various other substances with multiple functional groups [column 5 lines 9-4].

As for claim 25, PEDERSON discloses the consistency ranges of 0.1 to 40% which overlaps with the instant claimed range with sufficient specificity [column 5 lines 3-7].

As for claim 26, PEDERSON discloses the temperature range of 20-80 degrees C which falls within the instant claimed range [column 8 lines 30-32].

As for claim 27, PEDERSON discloses the treatment consistency ranges of 0.1 to 40% which overlaps with the instant claimed range with sufficient specificity [column 5 lines 3-7]. At a 40% consistency a majority of the water has been removed and the pulp can be considered a fibrous web.

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As for claim 30, it is not clear the steps or the amount of radiation emitted onto the fiber, or consistency of the fiber. As paper web/pulp are subjected to light on a paper machine, at least some light radiation (including UV) strikes the pulp/paper web capable of oxidizing a phenol group. Examiner notes peroxide with ultraviolet light forms hydroxyl radicals, an advanced oxidation process.

As for claim 31, PEDERSON discloses that treatment can take place sequentially or simultaneously.

5. Claims 1 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. 3,522,158 GARNETT, hereinafter GARNETT.

GRANETT discloses exposing lignin containing fibers to radiation [column 3 example 4] to graft styrene to said fibers. Styrene is compatible with (i.e. grafts to) the lignocellulosic fiber and provides properties foreign to the fiber including increased alkali resistance and acid resistance [column 4 lines 10-20]. GARNETT includes multiple other compounds including acrylonitrile and vinyl pyridine [column 2 lines 5-11] both species of which add nitrogen content to the fiber.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 22 and 40 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over 6,187,136 PEDERSEN et al., hereinafter PEDERSON.

PEDERSON discloses 0.001-10 mg enzyme per gram dry matter which is the instant claimed range [column 6 lines 60-67]. The applicant claims an enzyme dosage nkat/g (nanokatal/g) which the examiner has interpreted as an enzyme activity on pulp. However, the applicant does not state what the defined assay conditions this enzyme activity is measured. At different temperatures an enzyme can have different activities. Therefore the examiner cannot



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determine the proper metes and bounds of patent protection desired by the applicant.

PEDERSEN discloses 0.02 LACU/g -2000 LACU/g [column 6 lines 40-47] of enzyme where an LACU is measured under disclosed conditions [column 6 lines 55-60]. PEDERSEN additionally gives a specific point of 3 LACU/g which equals 50 nkat/g and falls with the instant claimed ranges of claims 22 and 40 [column 10 line 10].

Until shown otherwise the examiner has interpreted these ranges to overlap with the instant claimed ranges [since the applicant fails to define the units].

Alternatively, at the time of the invention it would have been obvious to optimize the enzyme activity on pulp [2144.05 (II) (B) Optimization of ranges and result effective variables]. PEDERSEN clearly shows enzyme activity on pulp to be a result effective variable and therefore its optimization would have been obvious to a person of ordinary skill, absence evidence of unexpected results.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY CALANDRA whose telephone number is (571)270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Daniels can be reached on (571) 272-2450. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anthony J Calandra/  
Examiner, Art Unit 1741